

## **CLAIMS**

### **What Is Claimed Is:**

1. A method for displaying and manipulating geographical information using World Wide Web technology, the steps comprising:
  - (a) means for retrieving geographical map images from a geographical map image storage database, the geographical map images contain individual raster images of the map divided from the whole map sheet or the satellite image;
  - (b) means for transforming the raster images into wavelet data stream which is completely retransformable back to the original raster images;
  - (c) means for compressing the wavelet data format stream into the compressed data stream;
  - (d) means for transmitting the compressed data stream over the network to the client side;
  - (e) means for decompressing the compressed data stream into wavelet data stream;
  - (f) means for retransforming the wavelet data stream into the raster images;
  - (g) means for displaying the raster image using one of either spatial information and a map viewer or spatial information and a map editor;
  - (h) means for analyzing user requirement and sending the suitable query to a spatial database;

- (i) means for retrieving vector data comprising of geographical elements from said spatial database;
- (j) means for retrieving information from said spatial database using metadata and geocode of the coordinate related with the geographical elements on the vector data;
- (k) means for editing information or vector data using said spatial information and a map editor;
- (l) means for storing geographical information in a management information system;
- (m) means for storing vector data in said spatial database; and
- (n) means for storing geographical raster map or satellite image in said geographical map image storage database.

2. The method of claim 1, wherein the geographical map can be any form of map including a registered satellite image.
3. The method of claim 1, wherein the wavelet transformation is used to transform said map into various resolution maps.
4. The method of claim 1, wherein said various resolution maps can be filtered for only desired resolution.
5. The method of claim 4, wherein filtered maps are compressed by using compression algorithms.
6. The method of claim 5, wherein compressed data is transferred over World Wide Web to the client by using an internet network.

7. The method of claim 6, wherein said compressed data is sent across the World Wide Web to a client process and decompressed into said wavelet data format.
8. The method of claim 7, wherein said wavelet format data is retransformed into a geographical map.
9. The method of claim 1, wherein said image data is sent to display on the spatial information and map viewer at the client side under control of the spatial information and map viewer, comprising the steps of:
  - (a) displaying the spatial information and map,
  - (b) receiving user input to zoom, pan the image; and
  - (c) receiving user input to query information from the spatial database and the MIS.
10. The method of claim 1, wherein user requirement is sent as a query to retrieve data from spatial database under control of the spatial database, comprising the steps of:
  - (a) storing vector data;
  - (b) storing map geocode that links to the information in the MIS;
  - (c) sending geocode to the MIS for more information; and
  - (d) sending vector data to the spatial information map viewer or the spatial information map editor.
11. The method of claim 10, wherein query is used with metadata to search for required data.

12. The method of claim 11, wherein metadata explains the meaning of data as well as its logical structure.
13. The method of claim 11, wherein the required data is compressed and sent back to the client.
14. The method of claim 1, wherein the spatial information and the map editor is an apparatus for editing geographical information and map under control of the spatial information and map editor, comprising the steps of:
  - (a) displaying the spatial information and map;
  - (b) receiving user input to zoom, pan the image;
  - (c) receiving user input to query information from the spatial database;
  - (d) editing geographical information on each element on the map;
  - (e) editing geographical map;
  - (f) storing changed information in management information system;
  - (g) storing changed vector data in the spatial database;
  - (h) storing new geographical image map or registered satellite image in geographical map image storage; and
  - (i) retrieving the spatial database.
15. A system for displaying and manipulating geographical information using World Wide Web technology, comprising:

- (a) means for retrieving geographical map images from a geographical map image storage database, the geographical map images contain individual raster images of the map divided from the whole map sheet or the satellite image;
- (b) means for transforming the raster images into wavelet data stream which is completely retransformable back to the original raster images;
- (c) means for compressing the wavelet data format stream into the compressed data stream;
- (d) means for transmitting the compressed data stream over the network to the client side;
- (e) means for decompressing the compressed data stream into wavelet data stream;
- (f) means for retransforming the wavelet data stream into the raster images;
- (g) means for displaying the raster image using one of either spatial information and a map viewer or spatial information and a map editor;
- (h) means for analyzing user requirement and sending the suitable query to a spatial database;
- (i) means for retrieving vector data comprising of geographical elements from said spatial database;
- (j) means for retrieving information from said spatial database using metadata and geocode of the coordinate related with the geographical elements on the vector data;

- (k) means for editing information or vector data using said spatial information and a map editor;
  - (l) means for storing geographical information in a management information system;
  - (m) means for storing vector data in said spatial database; and
  - (n) means for storing geographical raster map or satellite image in said geographical map image storage database.
16. The system of claim 15, wherein the geographical map can be any form of map including a registered satellite image.
17. The system of claim 15, wherein the wavelet transformation is used to transform said map into various resolution maps.
18. The system of claim 15, wherein said various resolution maps can be filtered for only desired resolution.
19. The system of claim 18, wherein filtered maps are compressed by using compression algorithms.
20. The system of claim 19, wherein compressed data is transferred over World Wide Web to the client by using an internet network.
21. The system of claim 20, wherein said compressed data is sent across the World Wide Web to a client process and decompressed into said wavelet data format.
22. The system of claim 21, wherein said wavelet format data is retransformed into a geographical map.

23. The system of claim 15, wherein said image data is sent to display on the spatial information and map viewer at the client side under control of the spatial information and map viewer, comprising the steps of:
- (a) displaying the spatial information and map,
  - (b) receiving user input to zoom, pan the image; and
  - (c) receiving user input to query information from the spatial database and the MIS.
24. The system of claim 15, wherein user requirement is sent as a query to retrieve data from spatial database under control of the spatial database, comprising the steps of:
- (a) storing vector data;
  - (b) storing map geocode that links to the information in the MIS;
  - (c) sending geocode to the MIS for more information; and
  - (d) sending vector data to the spatial information map viewer or the spatial information map editor.
25. The system of claim 24, wherein query is used with metadata to search for required data.
26. The system of claim 25, wherein metadata explains the meaning of data as well as its logical structure.
27. The system of claim 25, wherein the required data is compressed and sent back to the client.

28. The system of claim 15, wherein the spatial information and the map editor is an apparatus for editing geographical information and map under control of the spatial information and map editor, comprising:

- (a) means for displaying the spatial information and map;
- (b) means for receiving user input to zoom, pan the image;
- (c) means for receiving user input to query information from the spatial database;
- (d) means for editing geographical information on each element on the map;
- (e) means for editing geographical map;
- (f) means for storing changed information in management information system;
- (g) means for storing changed vector data in the spatial database;
- (h) means for storing new geographical image map or registered satellite image in geographical map image storage; and
- (i) means for retrieving the spatial database.